



SRS 3D SURROUND AUDIO PROCESSOR

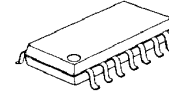
■GENERAL DESCRIPTION

The **NJM2199** is a SRS 3D surround audio processor regenerating the 3D surround sound with two speakers.

It regenerates 3D surround sound from stereo input only.

The features of wide operating voltage range, wide dynamic range, low output noise are suitable for any audio applications.

■PACKAGE OUTLINE




NJM2199M



NJM2199V

■FEATURES

- Operating Voltage (4.7 to 13V)
- Low Supply Current (5.7mA typ. at 3D Stereo mode)
- Low Output Noise (32 μ Vrms typ. at 3D Stereo mode)
- BYPASS Gain (0dB typ.)
- BYPASS FUNCTION (Through)
- WIDTH control
- Internal Mode Control Switch (2bit)
- Bipolar Technology
- Package Outline DMP14, SSOP14

The SRS technology right incorporated in the NJM2199 are owned by SRS Labs, a U.S. Corporation and licensed to New Japan Radio Co., Ltd. SRS is protected under U.S. and foreign patents issued and/or pending. SRS and the , are trademarks of SRS Labs, Inc. in the United States and selected foreign countries. Neither the purchase of the NJM2199, nor the corresponding sale of audio enhancement equipment conveys the right to sell commercialized recordings made with any SRS technology.

SRS Labs requires that all users of the NJM2199 must enter into a license agreement directly with SRS Labs if the royalty is not included in the purchase price. SRS Labs also requires any users to comply with all rules and regulations as outlined in the SRS Trademark Usage Manual.

For further information, please contact:

SRS Labs, Inc.
 2909 Daimler Street. Santa Ana, CA 92705 USA
 Tel:714-442-1070 Fax:714-852-1099 <http://www.srslabs.com>

■ABSOLUTE MAXIMUM RATING (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V+	15	V
Power Dissipation	P _D	(DMP14) 350 (SSOP14) 300	mW
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ELECTRICAL CHARACTERISTICS (V+=12V, Ta=25°C, V_{IN}=-10dBV(316mVrms) unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	TEST CONDITION					MIN.	TYP.	MAX.	UNIT
			INPUT		OUTPUT	MODE	WIDTH VOLUME				
			L	R							
Operating Voltage	V+		-	-	-	-	-	4.7	12.0	13.0	V
Operating Current	I _{cc}	No Signal	-	-	-	BYPASS	-	2.9	5.7	8.6	mA
			-	-	-	3D Stereo	MAX	2.9	5.7	8.6	
Reference Voltage	V _{REF}	V+/2	-	-	-	-	-	5.8	6.0	6.2	V
Maximum Input Voltage	V _{INMAX}	f=1kHz T.H.D.=3%	V _{IN}	-	L	BYPASS	-	10.0 (2.51)	12.0 (3.98)	-	dBV (Vrms)
		f=125Hz T.H.D.=3%	V _{IN}	-	L	3D Stereo	MAX	-1.5 (0.84)	0.50 (1.08)	-	
		f=125Hz T.H.D.=3%	V _{IN}	-	L	3D Stereo	MIN	-	11.5 (3.76)	-	
		f=125Hz T.H.D.=3%	V _{IN}	V _{IN}	L	3D Stereo	MAX	-	0.45 (1.05)	-	
		f=125Hz T.H.D.=3%	V _{IN}	V _{IN}	R	3D Stereo	MAX	-	11.9 (3.94)	-	
		f=125Hz T.H.D.=3%	V _{IN}	-V _{IN}	L	3D Stereo	MAX	-7.50 (0.42)	-5.50 (0.53)	-	
Channel Valance	CH _{BAL}	f=1kHz L-R Output	-	V _{IN}	L	3D Stereo	MAX	-1.0	0.0	1.0	dB
			V _{IN}	-	R	3D Stereo	MAX	-1.0	0.0	1.0	

■ELECTRICAL CHARACTERISTICS ($V_+=12V, T_a=25, ^\circ C$ unless otherwise noted)

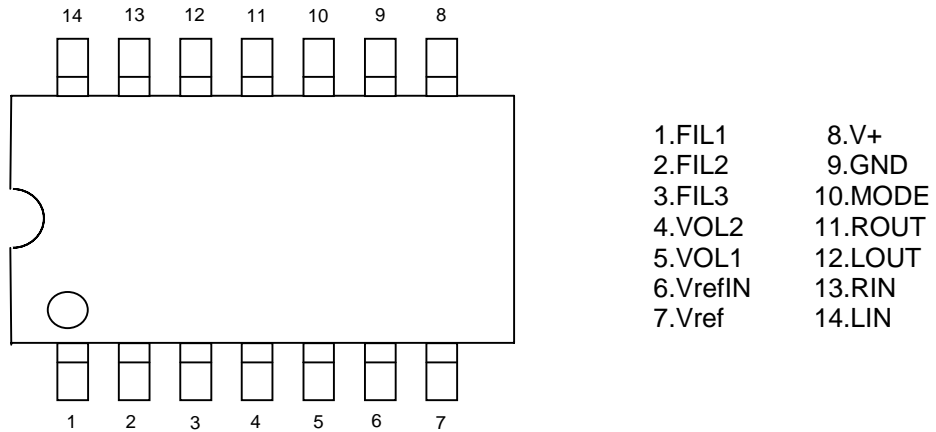
PARAMETER	SYMBOL	TEST CONDITION						MIN.	TYP.	MAX.	UNIT
		INPUT		OUTPUT	MODE	WIDTH VOLUME					
		L	R								
Output Noise	V_{NOISE}	Rg=0Ω A-Weighte	0	0	L R	BYPASS	-	-	-110 (3.16)	-95 (17.8)	dB (μV_{rms})
		Rg=0Ω A-Weighte	0	0	L R	3D Stereo	MAX	-	-90 (31.6)	-85 (56.2)	
Total Harmonic Distortion	T.H.D	f=1kHz	V_{IN} -	- V_{IN}	L R	BYPASS	-	-	0.005	0.01	%
		f=1kHz	V_{IN} -	- V_{IN}	L R	3D Stereo	MAX	-	0.1	1.0	
Bypass Gain	G_{Bypass}	f=1kHz	V_{IN} -	- V_{IN}	L R	BYPASS	-	-1.0	0.0	1.0	dB
SRS Gain	G_{SRS}	f=125Hz	V_{IN} -	- V_{IN}	L R	3D Stereo	MAX	9.4	11.4	13.4	dB
		f=125Hz	V_{IN} -	- V_{IN}	L R	3D Stereo	MIN	-1.5	0.5	2.5	
		f=125Hz	- V_{IN}	V_{IN} -	L R	3D Stereo	MAX	6.8	8.8	10.8	
Mode Select Control Voltage	V_{MODE}	V_{IN} = High Level	-	-	-	-	-	2.0	-	V_+	V
		V_{IN} = Low Level	-	-	-	-	-	0.0	-	0.7	

■MODE SWITCH

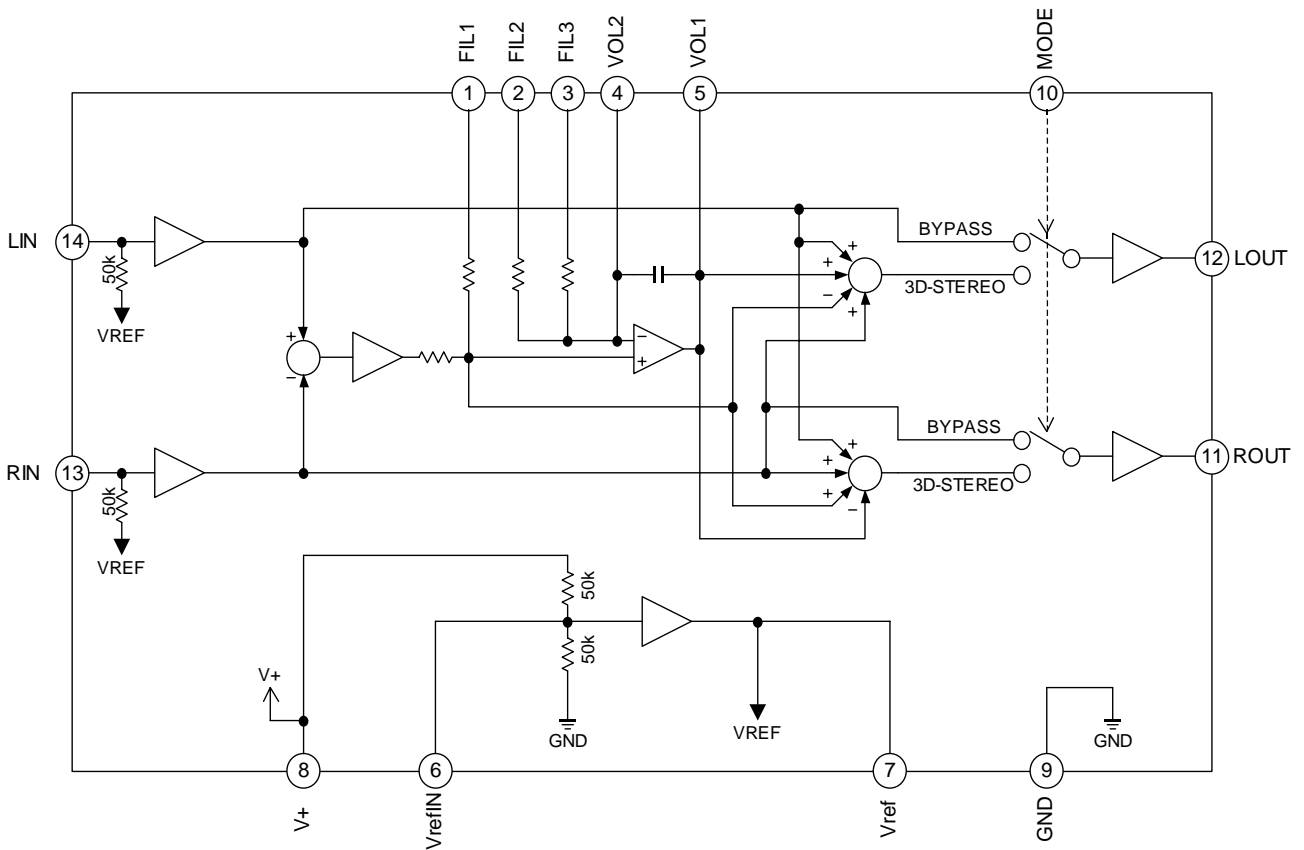
MODE	MODE
BYPASS	L
3D Stereo	H

NJM2199

PIN CONFIGURATION



BLOCK DIAGRAM




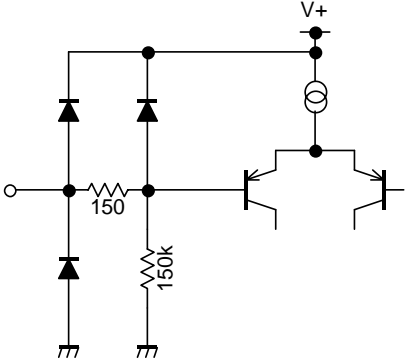
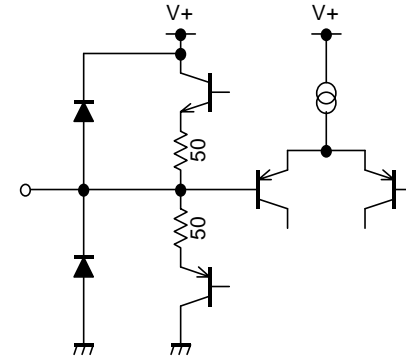
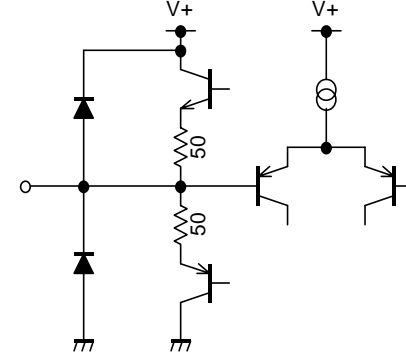
■ TERMINAL DESCRIPTION

PIN No.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
1	FIL1	Filter Input		$V+/2$
2	FIL2	Filte Input		$V+/2$
3	FIL3	Filter Input		$V+/2$
4	VOL2	WIDTH VR Input		$V+/2$

■ TERMINAL DESCRIPTION

PIN No.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
5	VOL1	WIDTH VR Output		$V+/2$
6	VREFIN	Reference Voltage Input		$V+/2$
7	VREF	Reference Voltage		$V+/2$
8	V+	Power Supply		$V+$

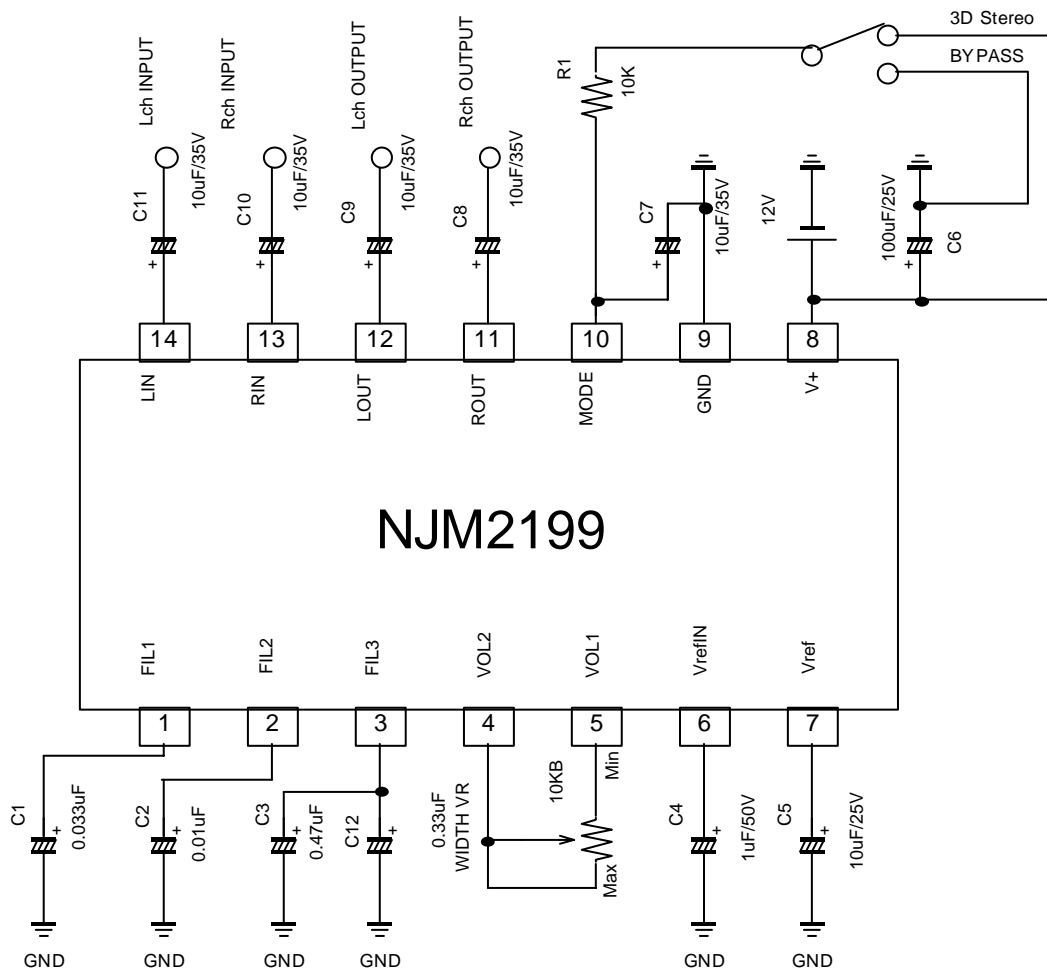
■ TERMINAL DESCRIPTION

PIN No.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
9	GND	GND		0V
10	MODE1	Mode Control		0V
11	ROUT	Rch Output		$V+/2$
12	LOUT	Lch Output		$V+/2$

■ TERMINAL DESCRIPTION

PIN No.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	VOLTAGE
13	RIN	Rch Input		$V+/2$
14	LIN	Lch Input		$V+/2$

APPLICATION CIRCUIT



Parts No.	Value	Tolerance	Parts No.	Value	Tolerance
C1	0.033 μ F	$\pm 5\%$	C5, C6	100 μ F	$\pm 20\%$
C2	0.01 μ F	$\pm 5\%$	C7, C8, C9, C10, C11	10 μ F	$\pm 20\%$
C3	0.47 μ F	$\pm 5\%$	C12	0.33 μ F	$\pm 5\%$
C4	1 μ F	$\pm 20\%$	R1	10k	$\pm 5\%$

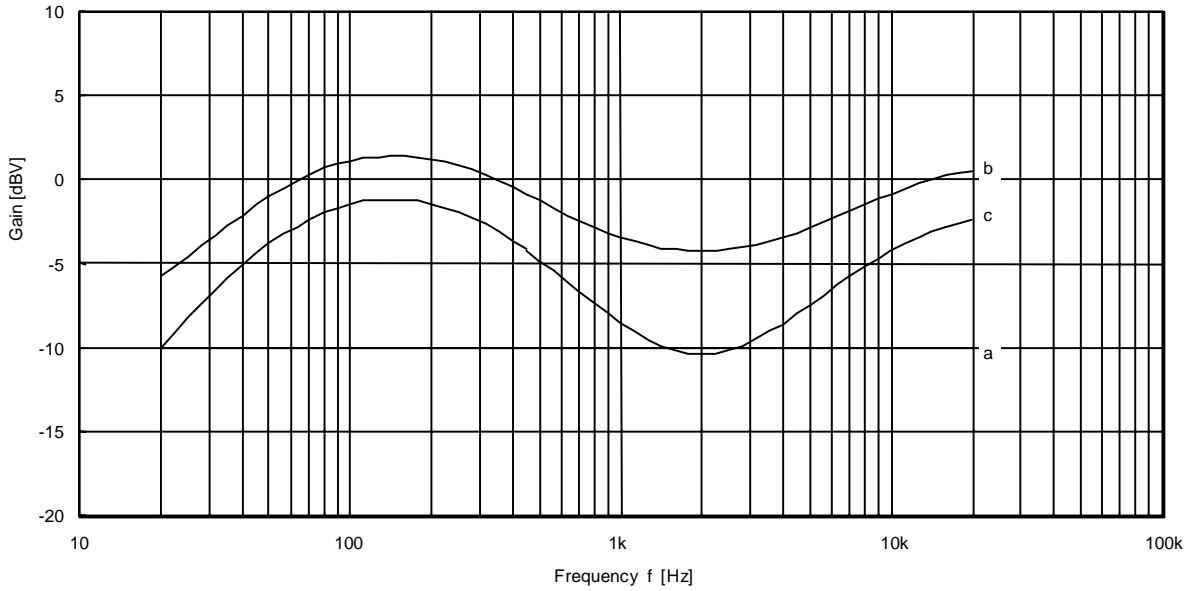
■ TYPICAL CHARACTERISTICS

NJM2199 GAIN STRUCTURE

a: BYPASS Mode Vin=-10dBV Lch Vout=Lch

b: 3D-Stereo Mode Vin=-10dBV Lch Vout=Lch

c: 3D-Stereo Mode Vin=-10dBV Lch Vout=Rch



[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.